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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/035,215

01/04/2002

Susan H. Woods

WWT-02-001US

3488

7590

06/21/2005

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EXAMINER

HAAS, WENDY C

ART UNIT

PAPER NUMBER

1661

DATE MAILED: 06/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/035,215

Applicant(s)

WOODS ET AL.

Examiner

Wendy C. Haas

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-17 and 41-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-7 and 41-43 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 14, 2004 has been entered.

Priority

Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. § 119(e) as follows:

Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged. Applicant's petition under 37 CFR j 1.78(a)(6), filed on September 14, 2004, to accept an unintentionally delayed claim under 35 U.S.C. § 19(e) for the benefit of the prior-filed application number 60/259,719, filed on January 4, 2001 was approved on May 11, 2005. However, the provisional parent application from which priority is claimed fails to provide adequate support under 35 U.S.C. 112 for claims 1-3, 5-17, and 41-43 of this application.

Applicant's parent application does not provide support for the following claim recitations:

Claim 1: the parent application does not provide support for solid media;

Claim 6: the parent application provides support only for LS or MS media as the basal plant medium, the parent application does not provide support for the inclusion of IAA, Kinetin or TDZ in the embryo induction medium;

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Claims 8 and 9: The parent application does not provide support for the inclusion of IAA in the embryo induction medium;**Claims 10 and 41:** the parent application provides support only for LS or MS media as any of the basal plant media;

Claim 12: the parent application does not provide support for the inclusion of IAA, Kinetin or TDZ in the liquid suspension culture medium;

Claim 13: the parent application does not provide support for the inclusion of Kinetin or TDZ in the liquid suspension culture medium;

Claim 15: the parent application does not provide support for the inclusion of 2, 4-D in the shoot multiplication medium;

Claim 16: the parent application does not provide support for the inclusion of Gamborg's vitamins in the shoot multiplication medium;

The remaining claims are unsupported due to the unsupported limitations of the claims they depend from. Specifically, Claims 2, 3, 5 and 43 depend from Claim 1; Claim 7 depends from Claim 6; Claim 11 depends from Claim 10; Claim 14 depends from Claim 12; Claim 17 depends from Claim 16 and Claim 42 depends from Claim 41. To receive benefit of the earlier priority date, all claim limitations in the present application must be supported by the (provisional) parent application's disclosure.

Claim Objections

Claim 1 is objected to because of the following informalities: there is a typographic error in section (a). Specifically, the claim recites "form" where it would appear to intend the recitation – from --. Appropriate correction is required.

Claim Rejections - 35 USC § 112

Claims 13 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, Claim 13 recites “0.5 – 2 mg/L BA, 1 – 3 mg/L BA”. This repetition of two different concentration ranges for BA is unclear and requires correction. Claim 14 depends from Claim 13.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5-7, 10, 11, 15 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Toth et al. or Linder et al., each in view of the other and Schwott.

Toth et al. teach a method for producing *Arundo donax* plants by culturing immature *Arundo donax* inflorescences that have been surface sterilized with 80% alcohol and cut into pieces on a primary medium containing MS salts, 30 g/l sucrose, 3.4 g/l gelrite and 2, 4-D in order to produce totipotent embryogenic callus tissue.

Toth et al. do not teach an additional culture step to obtain multiple shoots, rooting of the embryogenic callus or regeneration of whole plants. Toth et al. do not teach the use of BA, IAA, kinetin or thidiazuron.

Linder et al. teach a method for producing *Arundo donax* plants by culturing immature *Arundo donax* inflorescences on MS medium with 1 mg/l IAA and 2 mg/l of 2, 4-D in order to produce totipotent embryogenic callus tissue and then placing the callus on MS medium to regenerate whole plants with shoots and roots.

Linder et al. do not teach obtaining multiple shoots, or use of BA, sucrose or kinetin.

Schwott teaches production of *Arundo donax* plants and micro shoots on MS medium supplemented with 2 mg/l BAP (benzylaminopurine) and 0.5 mg/l PAA (penylacectic acid) followed by rooting in coco-peat substrate.

Schwott does not teach embryogenic callus induction, or use of sucrose, IAA, BA, 2, 4-D, kinetin or Thidiazuron.

It would be obvious for a person of ordinary skill in the art at the time the invention was made to combine the methods of Toth et al., Linder et al. and Schwott to micropropagate *Arundo donax* plantlets in tissue culture.

Toth et al., Linder et al. and Schwott all experienced great success using MS medium. Toth et al. directed their experiment toward embryogenic callus induction and did not perform additional steps. Linder et al. presented a poster session at the AIBS annual meeting. While the printed publication the Examiner accessed describes only embryogenic callus regenerating whole plants, production of microshoots between the two mentioned steps is an inherent, necessary occurrence. Both of these publications were made in 1998, a time prior to the request made by the inventor on the Plant-to listerv (see cited references and the end of Schwott) for more information regarding *Arundo donax* tissue culture protocols.

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It was this request that Schwott responded to with his description of how he was micropropagating *Arundo donax*. This serves as *prima facie* evidence that not only would a person of ordinary skill in the art been motivated, at the time the invention was made, to combine any number of successful teachings, such as these three cited in this rejection, to produce the claimed method, but that, in fact, one of the inventors of the instant application was actively seeking methods to modify in obvious fashions.

As such, the invention was *prima facie* obvious at the time it was made.

Claims 2-3, 8-9, 12, 13, 14, 16, 17, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Toth et al. in view of Linder et al. and Schwott, as applied to claims 1, 5-7, 10, 11, 15 and 43 above and further in view of Marton et al., Woods et al., Stuart et al. and Sutter.

The teachings of Toth et al., Linder et al. and Schwott are set forth above.

Toth et al., Linder et al. and Schwott do not teach transfer of the mature embryos to a liquid suspension culture medium to induce more embryos for splitting and subculturing; the specific use of LS medium with 1 mg/l IAA, 2 mg/l 2, 4 -D and 20 g/l sucrose; a liquid suspension culture medium supplemented with sucrose and 2, 4-d, BA, IAA, kinetin, or thidiazuron; the use of a liquid suspension culture medium comprising asparagine; the use of Gambourg's vitamins; or the use of half-concentration basal salts in the rooting medium.

Marton et al. teach the use of benzyladenine, kinetin or thidiazuron in the media and the use of half-strength medium for the second rooting medium; specifically, a multi-step microshoot tissue culture method of a sterilized immature inflorescence of *Arundo donax*

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comprising a first step of culture in half or full strength solid MS medium with B5 vitamins, 0.5 mg/l 2, 4-D, 1 mg/l BA, and 3 mg/l TDZ along with 30 g/l sucrose (page 11). The second step is culture in full or half-strength basal medium containing 0.02 mg/l TDZ and 30 g/l sucrose.

Woods et al. teach a three-step method of producing bamboo plantlets via somatic embryogenesis and tissue culture. In the first stage, a solid or semi-solid induction medium containing MS salts, NAA, BA and sugar is used. The preferable auxin concentration is between 0.1 and 10 mg/l, typically not exceeding 3 mg/l. (col. 4, lines 1-40.) In the second stage, a solid or semi-solid medium of MS salts, BA, sugar and 2, 4-D is used for somatic embryo induction. The amount of BA is 0.5 mg/l, though the disclosure notes this can vary from 0.3 to 3 mg/l. The sucrose concentration is 2% and can vary within the range of 2%-5%. (Col. 4, lines 41-63.) The third step of the method is either to germinate the somatic embryos on full to half-strength basal medium (Col. 5, lines 33-36) or to place the somatic embryos in a liquid suspension culture for further somatic embryo proliferation (Col. 5, lines 37-47.)

Stuart et al. teach the use of asparagine to increase somatic embryo size in liquid tissue culture.

Sutter teaches that LS medium is a variation of MS medium, well-known in the art, as MS medium with the deletion of Nicotinic acid, Pyroxidine HCl, Glycine and Caesin hydrolysate, and the addition of more Thiamine HCl. LS medium is known as an effective revision of MS medium that is simple to prepare (page 191).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the teachings of Toth et al., Linder et al. and Schwott in conjunction with the methods of Marton et al., Woods et al., Stuart et al. and Sutter.

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Marton et al. teach the use of solid medium, BA, kinetin and TDZ as well as B5 vitamins. None of these attributes of Marton et al. are referred to in the provisional application applicant has claimed priority to, and so do not qualify for the benefit of the priority date. A person of ordinary skill in the art would be motivated to use Marton et al.'s method because Marton et al. disclosed that over 200 plants were established and grown without difficulty (i.e. the method works.) Furthermore, the specific concentration(s) of TDZ in the claims are well within the range of TDZ concentrations utilized by Marton.

A person of ordinary skill in the art would be motivated to incorporate the teachings of **Woods et al.** because is an effective somatic embryogenesis and regeneration protocol for bamboo, a closely related species. It would have been obvious to a person of ordinary skill in the art to expect the method of Woods et al., with the auxin composition modified as suggested by Linder et al., to be an effective somatic embryogenesis and regeneration protocol for *A. donax*.

Stuart teaches the addition of asparagines to liquid suspension culture medium as an effective in stimulator of increased embryo size. Stuart further teaches that asparagine does not hinder embryogenesis. A person of ordinary skill in the art would be motivated to use Stuarts teachings to increase embryo size, especially as increased size is known in the art to correlate with increased viability.

Sutter teaches it would be obvious to modify the above methods by using LS medium. One would be motivated to do this because LS medium is an effective revision of MS medium that is easier to prepare. As such, each version of the method(s) claimed was *prima facie* obvious at the time the invention was made.

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Conclusion

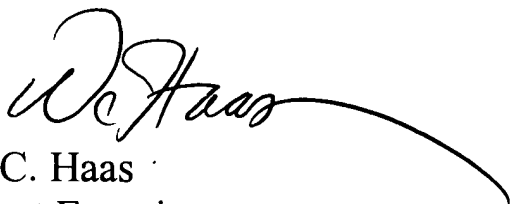
No claim is allowed.

Future Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wendy C. Haas whose telephone number is (571) 272-0976. The examiner can normally be reached on Monday through Friday 9:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571) 272-0811. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'W. C. Haas', with a long, sweeping horizontal line extending to the right.

W. C. Haas
Patent Examiner
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